

REMARKS

Claims 16-30 are pending. Claims 1-15 have been cancelled in previous correspondence. Claims 16-19 are withdrawn. Claim 30 is objected to. Claims 20, 21, 23, 24, 27, 28, and 30 have been rejected under 35 U.S.C. §102. Claims 22, 25, 26, and 29 have been rejected under 35 U.S.C. §103. Claims 20, 27, and 30 have been amended. Support for the amendment to claim 20 is found at least in claim 23 and in the drawings. Claim 23 has been cancelled herein. Claims 20-22 and 24-30 remain for consideration upon entry of the present Amendment. No new matter has been added.

The Examiner has objected to the drawings and indicates that the subject matter of this application is in need of a drawing to facilitate understanding of the invention. The Examiner has therefore required that a drawing be furnished.

Applicant submits herewith seven (7) replacement sheets of drawings in an effort to comply with the Examiner's request. Applicant, therefore, respectfully requests that the Examiner withdraw the objection to the drawings.

The Examiner has objected to claim 30 because of alleged various informalities and has required appropriate correction.

Applicant has reviewed the alleged informalities as pointed out by the Examiner and has made the requested changes. Accordingly, Applicant respectfully requests that the Examiner withdraw the objections to the claim.

Claims 20, 21, 23, 24, 27, 28, and 30 have been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 1,667,299 to Wildhaber (hereinafter "Wildhaber").

Wildhaber is directed to gear cutters for cutting longitudinally curved tooth gears. The cutter includes cutting blades, each of which comprises a body portion 17 and a cutting portion 18. The cutting portion 18 comprises a front face 19, two side faces 20 that are longitudinally curved front to back, a back face 21, and an end or top face 22. The cutting portion 18 has a front rake that defines the front face 19 being inclined rearwardly from the end or top face 22 to the body portion 17. Two side cutting edges 24 are formed by the intersection of the front face 19 with the two side faces 20. An end

cutting edge 25 is also formed by the intersection of the front face 19 and the end or top face 22. Each of the side cutting edges 24 is inclined rearwardly from the end cutting edge 25. Also, the side cutting faces are of helical form with reference to a rotary axis 14 of the cutter head. When assembled onto the cutter head, the cutting edges lie in a plane that is inclined to the face of the cutter head. In use, each of the side cutting edges is alleged to take a clean, sharp cut. When several cutting blades are arranged on the cutter head, each cutting blade takes a finishing cut. A cutter having such blades "will preferably be employed as a finishing tool, operating upon a blank which has been previously roughed out, though, if desired, the cutter may be used to rough out and finish cut."

Wildhaber fails to disclose, teach, or suggest a cutting blade comprising a shank with a cutting edge profile defined in part by first and second cutting edges that enable the tooth slot to be generated to a final geometry using one bar cutting blade in one milling pass, as is recited in amended claim 20. The cutting blade of Wildhaber is used as a finishing tool, or it can rough out and finish cut in consecutive steps. Several cutting blades are used in Wildhaber, as evidenced by the fact that "each of the side cutting edges takes a cut." In contrast, the final geometry is generated in the present invention using one bar cutting blade in one milling pass. One cutting blade having cutting edges that enables a tooth slot to be generated to a final geometry in one milling pass, as recited in amended claim 20, is patentably distinct from a cutter having multiple cutting blades that must make two or more passes to rough out and produce a finish cut, as in Wildhaber.

Wildhaber also fails to disclose, teach, or suggest a cutting blade comprising a shank with a cutting edge profile having first and second cutting edges defining rake angles (Y_{SX} and Y_{SV}) that are not both zero degrees, as is recited in amended claim 20. The rake angles in Wildhaber (Figure 5) are clearly zero. A cutting edge profile in which the first and second cutting edges define rake angles that are not both zero degrees, as recited in amended claim 20, allows one of the cutting edges to be offset or angled relative to the other cutting edge. When the cutting edges extend to define rake angles that are not both zero degrees and the cutting angles are offset or angled, as recited in amended claim 20, one of the cutting edges engages a workpiece such that one of the tooth flanks is cut ahead of the other tooth flank. Furthermore, chips can be removed by

being directed off to one side of the cutting blade. This is not the case in Wildhaber, where because of the zero angle both cutting edges (and thus the cutting profile) engage the workpiece head on. This is further supported by the entire cutting blade being longitudinally curved and rotated.

Wildhaber further fails to disclose, teach, or suggest a cutting blade comprising a shank with a cutting edge profile formed at one end of the shank by the intersection of at least one rake surface, at least two flat clearance surfaces, and at least one top surface, as is recited in amended claim 20. As can be seen in at least Figure 5 of Wildhaber, the two side faces 20 are of helical form (i.e., they are curved) to comport with the rotation of the mill. A cutting blade having a cutting edge profile formed by at least one rake surface and at least two flat clearance surfaces, as recited in amended claim 20, is not one in which the side faces are of helical form, as in Wildhaber.

Because Wildhaber fails to disclose, teach, or suggest a cutting blade comprising a shank with a cutting edge profile defined in part by first and second cutting edges that enable the tooth slot to be generated to a final geometry using one bar cutting blade in one milling pass, as recited in amended claim 20, amended claim 20 is not anticipated by the Wildhaber reference. Furthermore, because Wildhaber fails to disclose, teach, or suggest a cutting blade comprising a shank with a cutting edge profile having first and second cutting edges defining rake angles (Y_{sx} and Y_{sv}) that are not both zero degrees, amended claim 20 is not anticipated by the Wildhaber reference. Moreover, because Wildhaber fails to disclose, teach, or suggest a cutting blade comprising a shank with a cutting edge profile formed at one end of the shank by the intersection of at least one rake surface, at least two flat clearance surfaces, and at least one top surface, amended claim 20 is further not anticipated by the Wildhaber reference. For at least these reasons, amended claim 20 is allowable, and Applicant respectfully requests that the Examiner withdraw the rejection of amended claim 20.

Claim 23 has been cancelled, as indicated above. Dependent claims, by definition, further define the subject matter of the independent claims from which they depend. Because claims 21, 24, 27, 28, and 30 depend from claim 20, claims 21, 24, 27, 28, and 30 add recitations that further define the subject matter of independent claim 20. Because claim 20 is believed to be allowable for at least the reasons presented above,

claims 21, 24, 27, 28, and 30 are therefore also believed to be allowable. Consequently, Applicant respectfully requests that the rejections of claims 21, 24, 27, 28, and 30 be withdrawn.

Claim 22 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Wildhaber in view of U.S. Patent Application Publication No. 2001/0028831 to Iizuka et al. (hereinafter "Iizuka"). Claims 25 and 26 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Wildhaber in view of U.S. Patent No. 5,944,587 to Stadtfeld (hereinafter "Stadtfeld"). Claim 29 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Wildhaber in view of U.S. Patent No. 3,760,476 to Kotthaus (hereinafter "Kotthaus").

Claims that depend from a claim that is non-obvious are themselves necessarily non-obvious. Because claims 22, 25, 26, and 29 depend from claim 20, and because claim 20 is non-obvious in view of the amendments thereto, claims 22, 25, 26, and 29 are necessarily non-obvious. Applicant, therefore, respectfully submits that claims 22, 25, 26, and 29 are allowable. Accordingly, Applicant respectfully requests that the rejections of claims 22, 25, 26, and 29 be withdrawn.

Applicant believes that the foregoing amendments and remarks are fully responsive to the Office Action and that the claims herein are allowable. An early action to that effect is earnestly solicited.

If the Examiner believes that a telephone conference with Applicant's attorneys would be advantageous to the disposition of this case, the Examiner is invited to telephone the undersigned.

Applicant believes that no fees are due with the submission of this Amendment.
If any charges are incurred with respect to this Amendment, they may be charged to
Deposit Account No. 503342 maintained by Applicant's attorneys.

Respectfully submitted,

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